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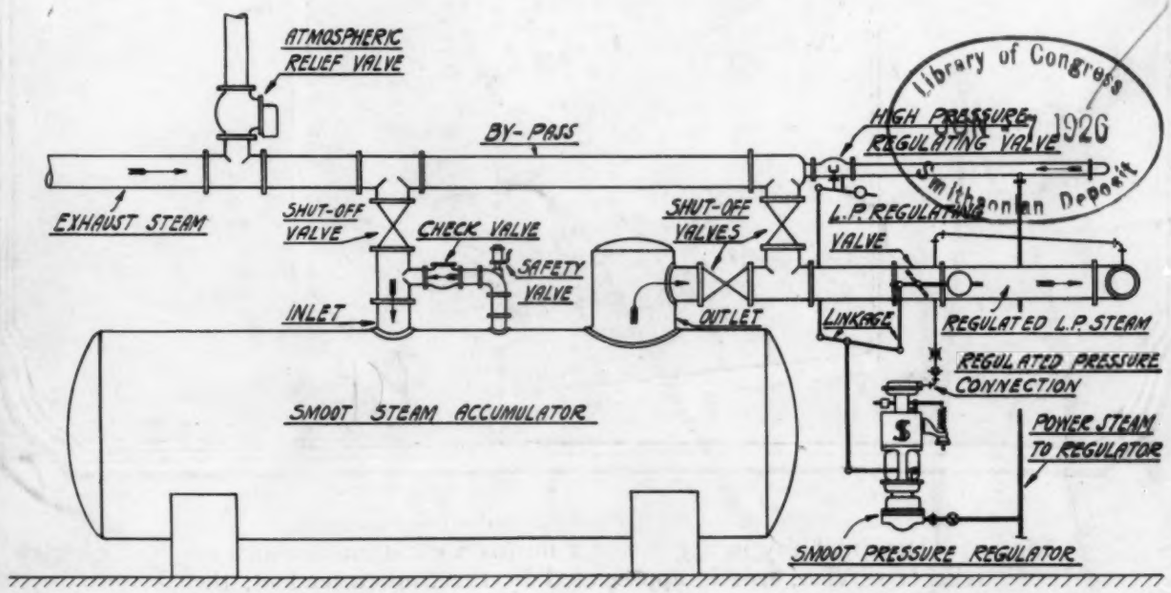
SMOOT STEAM ACCUMULATOR



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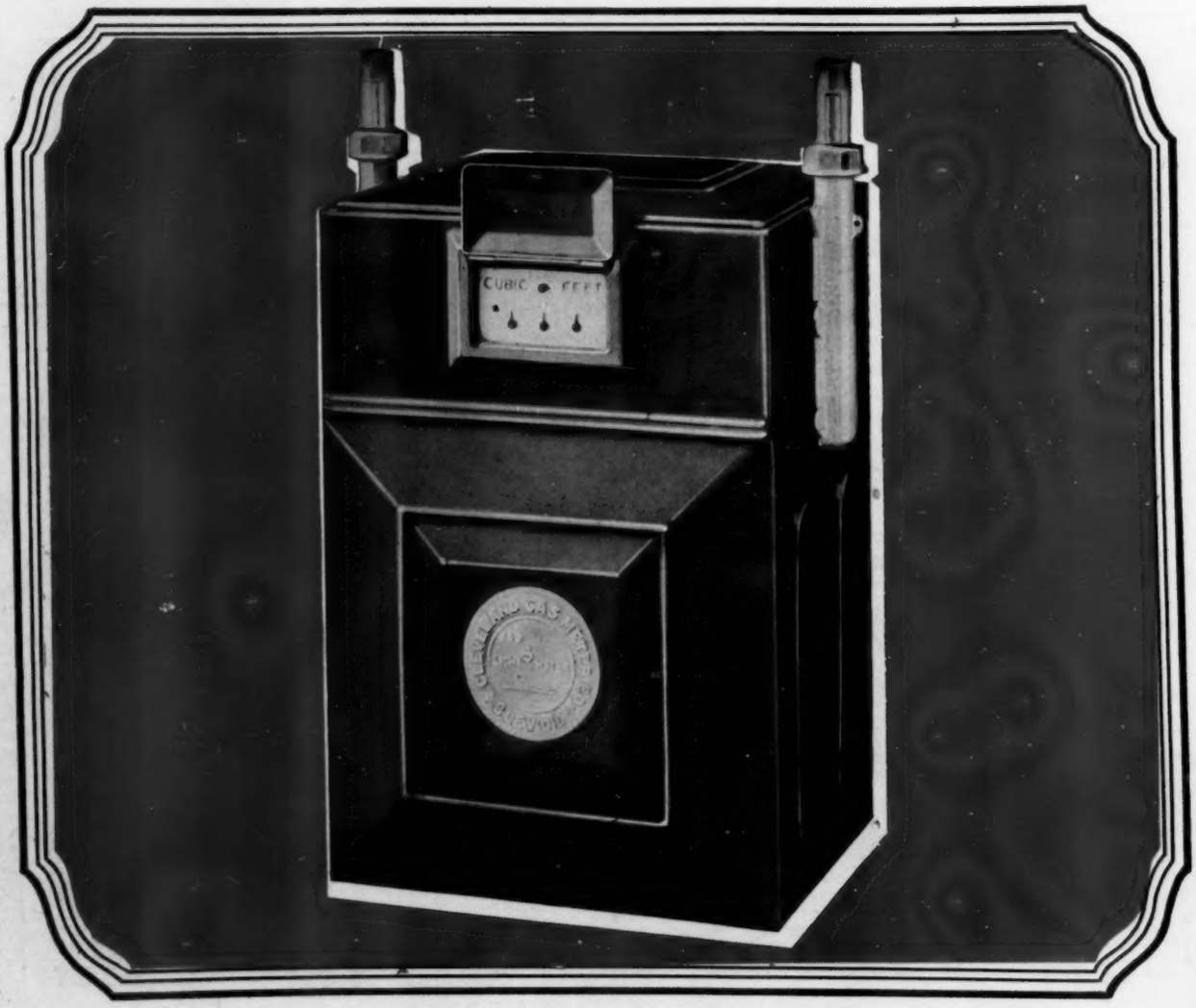

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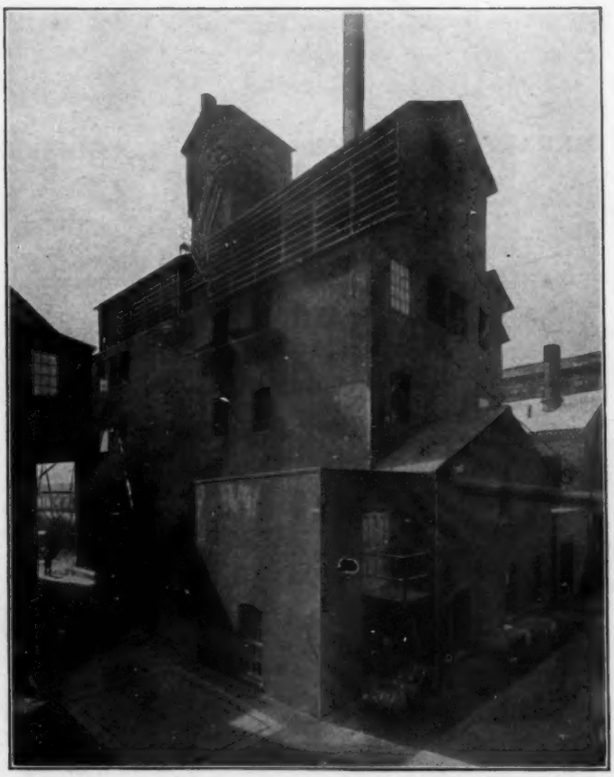

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SIXTY-SEVENTH YEAR

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AMERICAN
GAS JOURNAL

Established 1859—Pioneer of the Gas Industry

Vol. 124. No. 23. **NEW YORK, JUNE 5, 1926** **Whole No. 3579**

The Baltimore Plan of Industrial Education

III. Types of education and training

E. B. Luce

Educational Director, the Consolidated Gas, Electric Light and Power Company of Baltimore, Md.

IN the issues of November 28, 1925, and February 6, 1926, of the American Gas Journal were articles concerning the Baltimore Plan of Industrial Education. The first dealt with the principles and provisions of the plan, and the second with the method of administration. This will set forth the types of education and training provided for in the Baltimore Plan as follows:

a. Outside educational courses in co-operation with going educational institutions.
b. Group Educational Work inside the Company.
c. "Training in" of new employes.
d. Library Service.
e. Apprenticeship training.
f. Prizes for Efficiency Suggestions.

Our Faculty for Outside Courses

Twelve members of the gas and electric organization are instructors in outside night courses which the company's employes attend. More than two hundred other instructors are engaged in teaching the employes of the company who attend these outside courses.

It is the educational policy of the company to co-operate with and utilize existing educational agencies to the maximum rather than to establish courses inside the organization for the training, education and development of its employes. The overhead in buildings, equipment and maintenance, in addition to salaries of instructors, would be very large if a separate institution were to be established to do this work equally well.

Our employes have the full benefit of all the facilities of our universities, public schools, private schools, vocational schools and business colleges, together with their plants, including laboratories, equipment and other facilities of these "going" institutions. Thereby, the instruction by our large faculty is made the more effective, because the instructors work with all their carefully developed facilities, and because the employe-student develops himself under the most auspicious circumstances. The variety of subjects taught is as extensive as the number of instructors employed.

To establish a school within the company, offering like facilities, would be impossible. The expense is much less than for a large company school and the benefit to the company believed to be of greater value. There can be no doubt that, from the civic viewpoint, the benefit to the city is much greater than the company school plan for similar courses would be.

Summary of Enrollments By Institutions as of December 15, 1924

The Johns Hopkins University—Technical	109
The Johns Hopkins University—Business Economics	62
The University of Maryland	50
Maryland Institute	20
Y. M. C. A.	13
Y. W. C. A.	1
Baltimore Polytechnic Institute	83
Eastern High School	4
Western High School	1
Baltimore City College	56
Public School No. 1	4
Public School No. 76	6
Public School No. 112	1
Vocational Schools	15
Colored Vocational School	1
O. M. S. P.	1
Baltimore Business College	3

Park Business College	1
Eaton & Burnett Business College	1
Strayer's Business College	2
Bryant & Stratton Business College	1
Gill School of Shorthand	1
Thirty-Day Business College	1
Baltimore Pace Institute	3
Chicago Engineering Works	3
N. E. L. A. Adv. Acctg. (2); Lighting Sales (5)	7
International Correspondence School	6
Alexander Hamilton Institute	4
Chemical Institute of New York	1
Insurance Institute of America	2
LaSalle Institute	2
Bard Avon School of Expression	6
Private School	1
Martinet School of Art	1
Total	473

In the aggregate the employes of the company are pursuing ninety-eight courses in thirty-four different educational institutions.

Group Educational Work

Group educational work as carried on by the Consolidated Gas, Electric Light and Power Company of Baltimore has now completed its 10th year. It was started in 1915. One factor of importance in its

Class in Mathematics

success is the care exercised in planning and anticipating the future needs of a progressive and growing organization.

By means of the program for group meetings on a company-wide basis, employes learn to know one another better and gain common understandings which lead to better co-operation, which is so vital in a large service company. Inspection trips to the various company plants and to plants of other companies which are an important feature, give employes a valuable background of information. "Good Public Service" is the keynote throughout. At these meetings authentic information about the company is given, and the death knell given to any false rumors, which are often started innocently but work harm as they travel and grow. The company's methods, organization, functions and policies are frankly put before the employes and explained. The results are increased confidence and mutual respect.

The group meetings, as carried on by the company, offer an excellent means for developing the initiative of employes. The responsibility for planning and carrying out meetings rests on the employes themselves. This creates a situation which requires initiative and independent thinking, offering a most natural means for the development of leadership.

Record of Work

The following is a statistical record of group educational work since its inception:

Season	Year	Groups	Meetings	Attendance	Appro.	Expense	Expense per att.
First	1915-16	23	130	5028	.....	.....	....
Second	16-17	24	136	4389	.....	.....	....
Third	17-18	29	142	3661	2279.20	1949.89	53.2c
Fourth	18-19	19	74	2055	2200.00	1105.92	53.8c
Fifth	19-20	21	21	1960	1800.00	1624.90	82.8c
Sixth	20-21	19	109	4488	2300.00	2147.46	47.8c
Seventh	21-22	18	81	5509	2320.00	2920.00	53.8c
Eighth	22-23	18	80	4268	3220.00	2978.00	69.8c
Ninth	23-24	20	118	7524	4308.00	3836.22	50.9c
Tenth	24-25	30	195	12061	8100.00	7476.28	62.0c

The group work is supervised by the "Assistant to the Educational Director," but in its larger aspects of planning and administration, the Educational Director and the Educational and Training Committee take a most vital interest. The company is divided into six branches and a chairman is in charge of each. Each branch is divided into groups, each with a chairman and a secretary. The working organization for 1924-5 includes:

Educational Director; twenty-nine group chairmen. Assistant to Educational Director; twenty-nine secretaries. Six branch chairmen.

The following is a list of branches and groups:

Outside Courses Available and Utilized 1924-5, Showing Enrollments

A. C. Electricity	4
A. C. Machinery	4
A. C. Motor	1
Accounting Fundamentals of	32
Accounting, Corporation and Cost	12
Accounting II	5
Accounting III	4
Accounting IV	6
Accounting V-VI	1
Advertising, Principles of	3
Algebra I	9
Architectural Drawing	9
Arithmetic	15
Auditing	2
Auto Mechanics	4
Boiler Making	1
Bookkeeping	24
Building Estimating	1
Business	3
Business Law I	14
Business Law II	3
Chemistry	5

Civics	1
Civil Engineering—First year	8
Civil Engineering—Second year	2
Civil Engineering—Third year	2
Civil Engineering—Fourth year	4
Composition	7
Credits and Business Barometrics	4
Credits and Collection	4
D. C. Machinery	3
Economics	14
Electric Laboratory	2
Electric, Power House	1
Electric Wiring	3
Electrical Engineer—(Secondary)	18
Electrical Engineer—First year	29
Electrical Engineer—Second year	19
Electrical Engineer—Third year	14
Electrical Motor Work	11
Elementary Subjects	8
Engineering, Mechanical—Second year	4
Engineering, Mechanical—Third year	2
Engineering, Power Plant	2
Engineering, Steam Electric	1
Engineering, Structural	1
English I	34
English II	8
English III	1
English VII-VIII	3
English, Business	37
English Expression	6
Filing and Billing	2
Finance, Business	1
Finance, Corporation	7
Finance, Mathematics of	3
Foremanship	11
Freehand Sketching	1
French	3
Gas Engineering	17
Geometry	3
German II	1
Grammar	5
High School Course	2
History	2
History, Ancient	1
Industrial Management	1
Insurance, Fire	3
Investments	2
Labor Problems	8
Latin	2
Law	4
Lettering and Poster Design	1
Lighting Sales	5
Linotype Composition	1
Mathematics	42
Mechanical Course	2
Mechanical Drafting	3
Mechanical Drawing	12
Mechanics	1
Money and Banking	1
Office Practice	1
Organization, Business	4
Penmanship	14
Personnel Administration	1
Physics	1
Psychology, General	1
Public Speaking	10
Radio	2
Salesmanship	5
Secretarial Training	7
Sheet Metal Drafting	1
Shorthand	14
Showcard Writing	1
Spanish	2
Spelling	1
Traffic Course	1
Typewriting	18
Total	646

Public Relations Branch
- Application
- Collection
- Credit
- Billing and Balancing
- General Service
- Industrial Fuel
- Industrial Power
- Meter Reading
- Merchandise
- Employment

Electric Technical Branch
- Electrical Engineering and Construction
- Transportation
- Electric Stations
- Steam Stations

Gas Manufacturing Branch
- Gas Manufacturing
- Gas Engineering and Chemical

Gas Distribution Branch
- General Front Street

Accounting and Financial Branch
- Operating Clerical—Electric, Paymasters and Payroll
- Purchasing
- Operating Stores
- Printing and Mailing
- Tabulating
- Financial and Investment
- Accounting
- Construction Accounting
- Auditing and Inventory
- Accounting Service
- Balancing

Vocational Branch
- Stenographic
- Juvenile
- Health, Safety and Welfare
- Lighting Layout

Organization of Groups

Officers for the group organization are appointed. The Educational Director requests the superintendents to nominate employes whom they desire to recommend for branch chairmen. From these names, the Educational Director, after consultation

with the Educational and Training Committee, appoints them.

The branch chairmen, under the guidance of the Educational Department, organizes the groups in their branches according to the needs and desires of the departments. After consultation with the department heads concerned, they appoint the group chairmen. The group chairmen, in similar manner, appoint the secretaries.

The planning work for a group rests upon the group chairmen and the clerical work upon the secretaries. The selection of officers by the employes themselves, through the more democratic method of nomination and election by the groups concerned, has been considered and the decision reached that the plan in vogue was the preferable one.

Each group chairman is requested to look ahead, to plan ahead, and to submit a tentative schedule and outline for meetings to be held during the entire year. At the beginning of the season a joint list of all suggested topics is submitted to each group chairman, thus insuring a wide range for selection, and also advance planning, resulting in more effective

The Library in the Lexington Building

work. The schedule provides for seven meetings for each group, one each month from October to April, inclusive.

Meetings

Meetings are planned along the following lines:

Departmental

Discussions of every-day problems within a department. Study of routines, methods and policies of the company.

Vocational

Meetings of employes of various departments engaged in correlative work, to discuss problems of common interest. Motion pictures. Illustrated talks with lantern slides.

Inspection Trips

Inspection trips to departments within the company and also inspections of outside organizations. The Inspection Trip Committee of the Baltimore Gas and Electric Association has kindly offered its help in arranging these trips.

Inspirational

Meetings on general subjects not directly related to the company, usually through some big man in the industrial world, college professors, or lecturers.

Co-operative

Joint meetings of related groups to discuss routings and contacts.

Competitive

Debates, mock company, or departmental organization, mock trials, rate case hearings, etc.

Educational Equipment

The company has a moving picture machine, a Brayco Projector which reproduces "still" pictures from films instead of slides, and a projector for slides. These are often used in connection with meetings to add interest and concreteness. The library has a large file of lantern slides which can be used whenever desired. New slides are made as needs require from time to time. Brayco films of company activities are also in the making.

Two prizes are offered in each group, one of $5.00 and one of $2.50 to the two persons who accumulate the most points, based on attendance and participation, such as asking questions, entering into discussions, etc.

Three prizes are offered to the group chairmen to be awarded on the basis of percentage of attendance, promptness in sending in the season's plan and announcements of meetings and sending in the minutes afterwards which are kept by the secretaries.

Co-operation in planning and competition in execution are two important factors in its success.

The management makes an annual appropriation for carrying on this work. The cost of printing stationery and monthly announcements is an overhead expense paid out of the appropriation but not charged against the individual group's allowance. To the groups themselves, for the purposes of recreation, refreshments, meals, cigars, car checks, transportation for inspections, rental of an outside hall, etc., forty cents per attendant is allowed for each group meeting. The group chairmen and secretaries are free to use this allowance as they see fit. No restrictions are placed on them except to keep within the forty-cent limit.

Many of the groups send out individual announcements of their meetings each month, in order to attract as many as possible. For the larger meetings, the announcements are printed. Often cards are inserted and request made for their return to the chairman to indicate the recipient's intention about attending. This is necessary in order that proper provision can be made for number of meals to be served, size of hall to secure, etc.

Department Publishes Pamphlet

Each month a printed pamphlet is issued from the educational department showing day and date of all meetings scheduled for the month, subject to be discussed, comments on meetings already held and comparative statements concerning the standing of the different branches. During the year 1924-5 one hundred and ninety-five meetings were held. The aggregate attendance was 12,061, and the total cost $7,476.28. To give an idea of the nature of some of these meetings, the names of the outside speakers who addressed group meetings during the year 1923-4 are given:

Paul F. Stricker, Director of Baltimore Safety Council—"Accident Prevention."

W. R. Haydon, Johns-Mansville Company, asbestos manufacturers—"Breaks and Breaking of Automobiles."

F. W. Sperr, Jr., chief chemist of the Koppers Company, builders of gas works—"Liquid Purification."

Dr. Wm. O. Weyforth, Johns Hopkins University, on economics.

Walter Allen Gehnrich, Indirect Heat Oven Company, on "Gas Applications."

Henry Edward Warner, the Baltimore Sun—"Newspaper."

L. B. Fennemore, former employe.

Charles F. Goob, Electric Commission of Baltimore—"Underground Distribution."

Dr. E. R. Spedden, University of Maryland, Instructor Public Speaking—"Character Analysis."

T. B. Entz, Gould Storage Battery Company—"Manufacture of Storage Batteries."

Dr. R. B. Moore, Director of Experimental Investigation, Dorr Company—"Helium and Its Uses."

Dr. W. B. Weisblatt, "Retail Ledger" of Philadelphia—"Salesmanship."

Oscar Fogg, Baltimore Gas Appliance Company—"Opportunity for Gas Industry—Ideal Geographical Location of Baltimore."

Henry Schroeder, General Electric Company—"Sales, the Growth of Mazda Lamp."

L. B. Springsteen, American Writing Paper Company—"Manufacture of Paper."

Messrs. Peters and Trout, Air Reduction Company—"Manufacture of Oxygen—Practical Uses of Liquid Air."

J. M. Keeler, Scott Paper Company—"Manufacture of Paper."

(The concluding article in this series will be published in the near future.—Editor.)

Gas Heating System Supplants Low Pressure Steam

Change of heating system necessary to retain tenants

J. B. Dillon

IT is told in history that St. Augustine said that when we are sorely troubled we invoke the Lord, but when the visitation is passed, we forget the Lord. This, many of us will attest, is a true statement and it also proves why it is difficult to convince folks that "in the good old summer time" they should think of proper heating systems for the home. But who wants to think of artificial heat in the warm season. A glance at the photograph herewith will show the Carmen Court, located in the Country Club district of Denver, Colorado, and it will show that Old Man Winter is present. The building—a very inviting one—contains six apartments. It is built on the general outlines of the Indian pueblos; something different than the usual type of construction, but pretty, though it is, "pretty is as pretty does." It was impossible to keep satisfied tenants. Why?

Defective Heating System

To heat the rooms a low pressure steam plant with oil burner under the control of pressure regulators was selected. Steam from the boiler was conducted to six radiators, one in the basement of each apartment, Air drawn from one of the rooms of an apartment was forced through the radiators by means of a fan, the resulting warm air piped to the upper floors by means of hot air pipes. The "blower" was not in operation all the time, but was under the control of either of two switches, conveniently placed so that the occupant could start the circulation of hot air at any time by closing the switch that operated the motor. An individual electrical meter recorded the current used for the particular apartment.

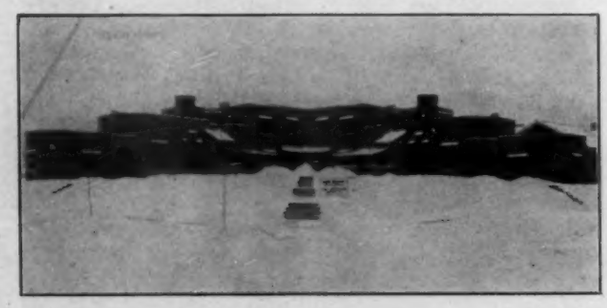
Theory vs. Practice

A wonderful plant we would say. Everything was carefully planned. But, as condensate from the radiators must be returned to the boiler, the radiators were placed almost at ceiling level of the basement, supported by angle iron frames. Although the motors were of standard type the location caused a

"hum" all over the apartments and the women folks who had to live with it could not tolerate it; hence it was that the tenants, much as they loved these unique apartments, sought quarters where they did not have to listen to an agonizing tuneless hum.

Problem Not An Easy One

The varied and odd shapes of the exterior of the building was also carried interiorly, in some respects; hence the location of the heat pipes was not easy to decide, because the best location of the pipe would in some respect mar the beauty of the "spot," and then the next best position was used. Because of this and the fact that under the steam



The Building That Was Heated

system the air at its source of heat was not sufficiently heated to start on its journey through the pipes, the result was that instead of hot air being fed into the radiators, the air was almost cold. The location of the boiler and burner in the basement of the junction of the two halves of the building proved so noisy that the apartment above was impossible to rent, or at least to stay rented any length of time. Added to all this trouble was that of imperfect combustion and a bad odor brought about by changing to "Off" and "On" positions.

Investment Must Be Protected

The owner was not long in finding out that something must be done to take care of what otherwise was a wonderful building and wending his way to the Public Service Company, he discussed the problem with C. E. Muehlberg, superintendent of the house heating by gas department and with Ottomar O'Donnell, Engineer. The place was inspected and the owner was assured that all could be remedied, substituting gas for fuel—a change here and there.

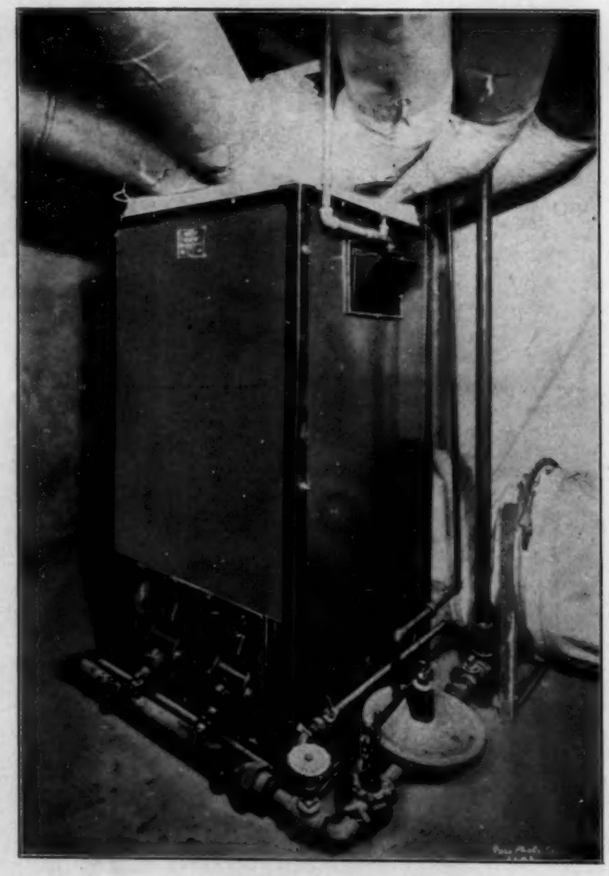
Show Me

The owner was willing if they could guarantee to cure the evils and the guarantee was given; the work begun. Six individual gas-fired hot air furnaces were placed in the six basements, early during the month of February, the type used known as No. 20-Q Bryant. The former steam line proved an ideal gas supply line from a centrally located meter to each basement. The furnace construction takes cold air at the floor line, therefore the blowers were moved from their lofty heights down to the concrete floor. Right here the vibratory fault was eliminated and then to deaden the "hum" flexible canvas connections were placed on both sides of the fan. The human element was removed when standard thermostats were placed in each apartment. The blower is always in operation when the gas is burning. Of course a switch is provided so that the system may be shut down at any moment, but under winter day heating conditions the thermostat takes care of the regulatory functions.

Pleasing Results

When the gas heaters were installed the tenants could hardly believe that it was the same place. The whole house was warm. There was no out of tune humming, nor was there the repugnant odor of unconsumed fuel (just think of the rear of your automobile when it is exhausting), and the bill for the improvement was no more for getting first-class heat than it was for an inferior heat, with the further satisfaction that living quarters were made serene.

(Continued on page 506)



Six of These Did the Work

The Low Temperature Carbonization of Coal *

Description of carbonization processes

A. G. Fieldner

FELLNER-ZIEGLER Rotary Retort.—This retort was the only low-temperature carbonization plant that I found in actual operation in Germany (see Figure 8). At the time of my visit test runs were being made on sample shipments of non-coking gas coal from Upper Silesia. The egg and nut size screened lumps charged into the retort came out in their original form, except that they were shrunken and checked with shrinkage cracks. The semi-coke had an apparent density of about 0.7 and would serve as a smokeless fuel for stoves and house heating furnaces. This particular retort at Gelsenkirchen was said to have been operated intermittently over a period of two and one-half years. It appeared to be in good condition. The retort is heated externally. It is 2.5 meters (8 ft.) in diameter and 20 meters long (65 ft.), mounted at 5 per cent. inclination from the horizontal. It is provided with a

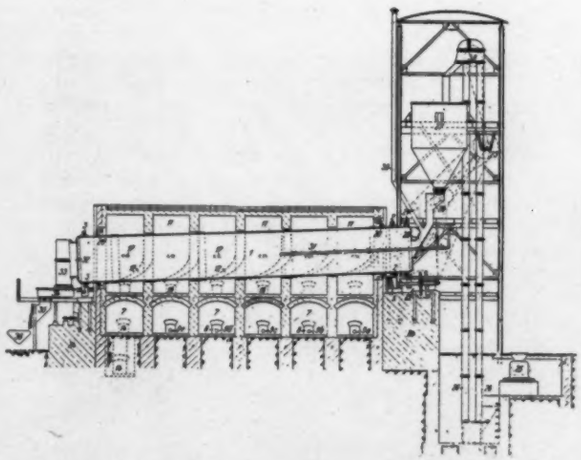


Fig. 8. Fellner-Zeigler Retort at Blast Furnace Plant of Gelsenkirchener Bergwerk A. G. Gelsenkirchen

reciprocating scraper to keep plastic coal removed from the retort surface. This scraper may function with weakly coking coal, but I doubt whether it can keep strongly caking coal removed from the shell.

The semi-coke from weakly coking coal was soft and pulverulent. It should be ideal material for pulverized fuel furnaces. The by-product recovery plant included a Linde 3-stage compressor for separation of easily condensable gases by liquefaction.

The daily output of this plans when in full operations is given by Thau[11] as follows:

Capacity and Yield of Fellner-Ziegler Rotary Retort

Throughout, tons of run-of-mine coal.....	54
Semi-coke (9 to 10 per cent volatile matter), per cent	77.04
Gas, cubic feet per ton.....	3,883
Tar, per cent	6.46
Pitch, per cent	0.78
Gasoline, per cent	1.58

Stinnes Double Rotary Retort[12].—The double-cylinder inclined rotary retort recently installed at Karnap, near Essen, by the Mathias Stinnes Colliery (Figure 9) is an attempt to increase the thoroughput of a given size of rotary by utilizing the middle space of the big cylinder as a drier and preheater for the incoming charge of coal. The retort is externally heated with producer gas burned in combustion chambers adjacent to the retort. Provision is made for diluting the hot combustion gases with flue gas to provide uniform and closely regulated temperatures around the retort.

The outer retort, approximately 2.6 meters (8½ ft.) in diameter and 20 meters (65 ft.) long, is entirely supported on the inner retort which carries the driving mechanism. This arrangement is said to be a decided structural advantage in that the large stresses and loads come on cold metal, the inner retort never exceeds a maximum temperature of 250 degrees C. (482 degrees F.). The steel shell of the outer retort may go up to 600 degrees C., or even 700 degrees C. (1112 degrees to 1292 degrees F.) without causing an essential injury to the retort. It

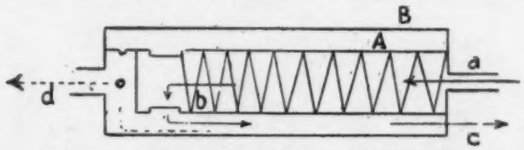


Fig. 9. Outline Sketch of Stinnes Retort

is also claimed that the slow pre-heating of the coal in the inner cylinder changes the nature of coking coals so that moderately caking coals can be carbonized without sticking on the walls of the retort.

I observed several hundred tons of a soft, friable semi-coke on piles near the retort, but it was suitable only for pulverized fuel.

It is claimed that through the double cylinder feature and to pumping off the evolved gases and vapors counter-current to the flow of the coal, practically no decomposition of the tars takes place, and the tar yield is 100 per cent of the laboratory yield in

* Fourth installment of Mr. Fieldner's paper read at Johns Hopkins University.

[11] Paper to be published in an early number of Blast Furnace and Steel Plant, 1925.

[12] Ueber den Einflus der Drehofen Konstruktion auf die Zusammensetzung der Urteere und Gasbenzine, von F. Muller, Karnap bei Essen; Brennstoff Chem. vol. 5, 1924, p. 388.

contrast to the 60 per cent yield in rotary retorts in which the vapors are removed at the discharge end of the retort.

At the time of my visit the retort was shut down for changes in design after an experimental run of five months.

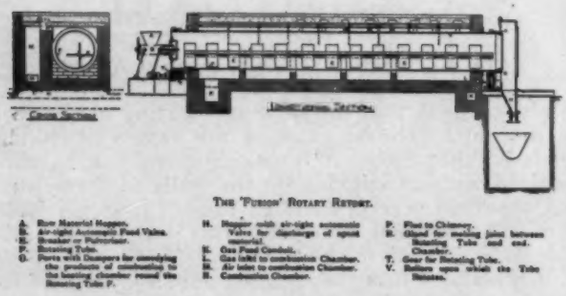
According to the engineers in charge, the principal unsolved problem was to increase the capacity of the unit from about 50 to 100 tons per 24 hours. It was hoped to do this by the introduction of superheated steam directly through the coal in the outer cylinder.

Fusion Process

The "fusion" rotary retort, which is operating on a small experimental scale at Middlewich, Cheshire, England, is similar to the Thyssen retort except that the spiral ribs are omitted and a star-shaped steel tumbler, as shown in Figure 10, is introduced within the retort to prevent sticking of plastic coal on the sides of the retort. It is possible, therefore, to use a coking coal. The product contains a high proportion of fines which must be briquetted for domestic fuel or pulverized for powdered fuel furnaces. No large-scale plants have yet been built in England.

Internally Heated Retorts: Coal in Direct Contact with Gases or Liquids

Internally heated retorts differ radically from the externally heated types described. These processes are usually continuous—the coal descends in a vertical shaft through which preheated gases or vapors ascend and impart their sensible heat directly to the pieces of coal. Products of combustion, producer gas, water gas, coal gas, superheated steam or combinations of these gases have all been tried. Generally speaking, this type of retort contains no moving mechanism and is usually of cheaper construction



THE 'FUSION' ROTARY RETORT.

Fig. 10. *"Fusion" Rotary Retort*

than externally heated retorts. It is not, however, adapted to strongly fusing coal on account of caking and hanging in the retort. Likewise the gas cannot circulate uniformly through the mass if the pieces melt together. Screened lumps of non-coking coal or briquetted fuel is best adapted for retorts of the internally heated type.

The principal disadvantage of introducing hot combustion gases into the charge is the dilution of the distillation products. The resultant large volume of gas of low calorific value must be used at the point of production, and the light oils have too low a partial pressure to be profitably recovered by oil scrubbing the gas. Superheated steam has the advantage of a greater heat carrying capacity than non-condensible gases, but it in turn involves loss of the latent heat of the steam and extra cost of superheater, satisfactory designs of which are not yet available for the temperatures required. Nevertheless, the low first cost and the simplicity of internally heated retorts had led to many designs based on this principle, some of which are now in large-scale experimental operation.

Coal in Screened Lumps or Briquets Directly Heated by Hot Gases Generated by Air Blown Into the Retort

Maclaurin Low-Temperature Carbonization Process—The Maclaurin retort (Figure 11) is essentially a large by-product recovery gas producer in which part of the semi-coke is burned to producer gas, the sensible heat of which carbonizes the descending charge of coal. The experimental producer near Glasgow, Scotland, is of square cross-section about 45 feet high and 8 feet wide at the widest part. The air blast is introduced about 12 feet above the discharge doors through a large number of narrow ports in opposite side walls, and also by similar ports in a dividing wall which is carried across the center of the retort at the same level. The coke is cooled in the zone below the air ports by steam injected at the discharge doors; part of this steam ascends through the coke and becomes heated and partly decomposed into water gas, then passes upward and mixes with the producer gas formed in the combustion zone. The raw coal is fed from an elevated hopper through a bell into the top of a cylindrical steel tank 8 feet in diameter and 10 feet high, resting on the brick work at the top of the retort. The tank serves as a condenser for the oils and tars that drain down the side of an inner steel cylinder, which dips into the well formed by a dished flange at the bottom of the tank. From the annular space between the tank and the cylinder the gases are led off to tower coolers and scrubbers.

The capacity of the retort is about 24 tons of coal per 24 hours. The coal should not be strongly coking, otherwise the charge will stick and not descend uniformly; neither will the hot gases be distributed evenly throughout the charge. The retort can be operated for complete gasification or for production of smokeless fuel; the adjustments necessary are in the regulation of the air blasts and the gas outlet valves. The operating temperatures are 750 degrees C. at the air tuyeres, 200 degrees C. at the bottom of the steel tank on the top of the brick work, and 60 to 80 degrees C. in the gas offtake.

The semi-coke produced is but slightly fused, of low density, and somewhat friable; it is not a high-class domestic fuel—nevertheless, the Glasgow Gas Corporation is installing a battery of five producers aggregating 100 tons of coal per day at the gas plant

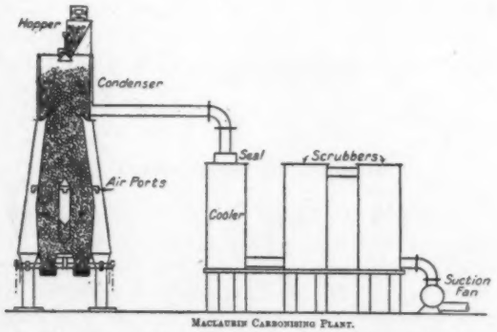


Fig. 11. *Maclaurin's Carbonizing Plant*

for the purpose of supplying gas for heating vertical gas retorts and at the same time producing low-temperature coke for smokeless domestic fuel. They expect a yield of 22,000 to 27,000 cubic feet of gas of 240 B.t.u. per cubic foot; 12 to 17 gallons (U. S.) of dry tar oil, and 14 to 15 pounds of ammonium sulphate per short ton of coal.

Hood-Odell Lignite Carbonizing Process—The Hood-Odell oven for carbonizing lignite (see Figures 12 and 13) is similar in principle to the Maclaurin retort, except that no by-products are recovered. The sole object is to convert brown lignite, which contains from 35 to 40 per cent of moisture, into a stable, usable solid fuel. The oven is cheaply constructed from standard refractory materials. The first cost is low and the through-put per unit is high. About 50 to 60 per cent of the carbonized material can be screened out for direct use as domestic and industrial fuel, while the remainder can be briquetted, forming a high-grade domestic fuel.

Powdered Coal Carbonized by Hot Gases

As the time of carbonizing a lump of coal by hot gases decreases with the size of the lump, it follows

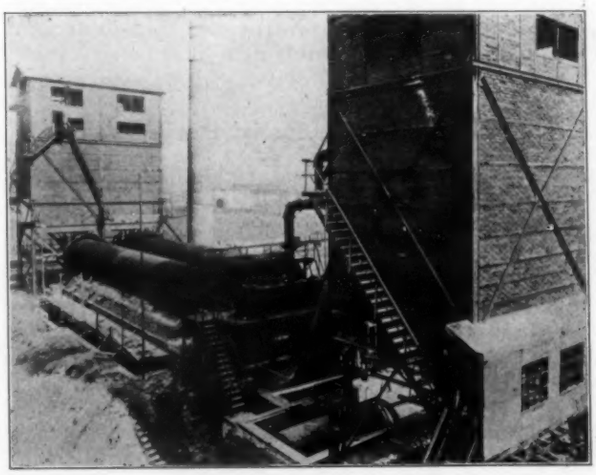


Fig. 12. *Hood-Odell Lignite Carbonizer*

that pulverized coal introduced into a stream of hot gases can be carbonized very rapidly. I am told that very promising experiments along this line have been made within the last year. It is possible that a high-capacity process can be developed for oil recovery from coal that is to be used in pulverized fuel firing in large central power plants.

Taxation of Utilities

Disproportionate division burdens the public service company

George K. Miltenberger

Assistant to Vice-President, Union Electric Light and Power Company, St. Louis, Mo.

THIS paper is not intended as an exhaustive report on the subject of taxation, nor does it spring from a feeling that the writer has any particular knowledge not possessed by others, but is intended merely to call the attention of utility operators to the rising tide of taxation and to solicit their co-operation in perfecting defensive measures.

The Problem

The increasing cost of government is naturally a universal problem and affects every individual and every enterprise and is the result of a combination of circumstances, not the least of which are the increased services rendered by State and local governments in the matter of education, roads and bridges and reclamation of land. We have the impression, however, that the burden is falling disproportionately upon the utilities and this is the problem which we desire to present and seek assistance for its solution.

Utilities Should Pay Taxes

We need take up no time here in debating the argument as to whether utilities should be subject

to taxation for, in spite of the plausible arguments to the contrary, it is generally conceded that utilities should assume their fair proportion of the cost of government and this expense is a proper one to be added to the cost of service rendered. It is not conceded, on the other hand, that utilities should be made the tax gatherers of the community and the increasing burden laid upon utilities is rapidly placing them in this unfortunate position.

Utilities Have Special Privileges

Utilities in the very nature of things are corporations and as such are subject to all forms of taxation applying thereto; but in addition to this, because of their position as natural monopolies and being accorded special privileges, which in turn subject them to governmental regulation, they have to pay for these special privileges through additional forms of taxation and the old adage holds true that you cannot secure anything without paying for it. It is questionable, however, whether the additional amount now paid by utilities for these privileges is equitable.

Extent of Taxation

It is a lamentable fact that statistics on the subject of taxation are scarce. We have before us some information gathered by the Commonwealth Edison Company some years ago showing that public utilities paid an average of $5.80 in taxes per hundred dollars of gross revenue in 1922, whereas manufacturing concerns paid an average of $3.33 in taxes per hundred dollars of value of products. The information on public utilities applied to all of them under the general heading of central stations, electric and steam railways, telephones and telegraphs and gas manufacturing companies. From this general average there are, of course, exceptions and some of the utilities are taxed more heavily than others.

Having investigated the tax situation of our own company, we can state with regretful assurance that the year 1925 our company paid in taxes $10 out of every $100 of gross revenue and we anticipate that in 1926 our taxes will probably be $12 out of every $100 of gross revenue. These payments were made through not less than sixteen different kinds of tax levies, as shown below, and this number is constantly increasing as the cost of government exceeds the legal limit of existing kinds already provided.

Name of Tax	Assessed by
1. Personal property tax	State Tax Commission
2. Corporation franchise tax	State Tax Commission
3. Occupancy or privilege tax	Municipality
4. Merchants and manufacturers tax	Municipality
5. Real estate tax	County, Municipality
6. Occupational tax	Municipality
7. Vehicle and chauffeur tax	State, Municipality
8. Local improvements tax	Municipality or District
9. Merchants license	Municipality
10. Annual registration fee	State
11. Capital stock tax	Federal Government
12. State income tax	State
13. Federal income tax	Federal Government
14. Bond interest withheld at source	Federal Government
15. Sales tax	Municipality
16. Gasoline tax	State

Business in Government

The principal problem in any utility is that of financing and to that end we employ the best brains and talent of the community and of the country, but to what extent are these agencies employed when the problems of governmental finance are raised? It is extremely doubtful whether business men who are so largely affected in their affairs by the cost of government pay any attention to, or have any hand in, the methods employed or devised for raising money to defray the cost of government.

We pride ourselves on the efficiency with which we operate our companies and in fact our very existence demands upon our doing so, but what attention is paid to, and what assistance do we render in seeing that public expenditures are made with due economy? It is time we came to a realization that government must not be left in the hands of lawyers and politicians but that business men must take a hand or else be satisfied to pay the bill.

Difference in Assessing Utilities

Referring to the list of various kinds of taxes levied, it will be seen that utility taxes vary from other corporations principally in the matter of occupational or special privilege taxes, and personal property taxes. The occupational or special privilege taxes are levied by the community in which the utility serves and apply mostly to the electric utilities. The taxes on personal property are different from that of other corporations in that the assessment is made by the State Tax Commission and the State Board of Equalization. This is not universally applied to utilities now but the present trend of legislation indicates that sooner or later they will all be included. The railroads have long been assessed by this State body, as have the street railroads, telephones, telegraphs and bridges, and more recently the electric light and power companies and pipe lines.

Disadvantage of State Assessment

There are distinct disadvantages in having the assessment of personal property made by this central agency, not because these bodies are incapable of making assessments, but because they are capable of doing it, and have at their command a source of information which is not accorded the local assessing authorities when the occasion arises for assessing the personal property of other corporations and private individuals.

The books of account of utility companies showing their property and assets are a matter of public record in the offices of the State, as are also their income accounts, because these must be filed with

(Continued on page 506)

Taking Advantage of Opportunities to Make Sales

When installment purchasers complete their payments

Frank H. Williams

WHEN installment purchasers complete their payments for the gas ranges and appliances of various kinds they have bought from the gas company, the company has the best sort of an opportunity for doing things which will make warmer friends of such customers and lead to more business from them, their friends and relatives.

For instance, when the final payment is made by a purchaser on a range or water heater or something of that sort, the company can send this sort of letter to the customer:

A Suggested Letter

"Mr. John A. Smith,
"914 Magnolia Avenue,
"City.

"Dear Mr. Smith:

"Our records show that you have just made your final payment on the gas range purchased from us over a year ago and we want to take this opportunity for again thanking you for this business and thanking you, also, for the unfailing promptness with which you have made all your payments.

"We felt at the time of making this sale that we were dealing with the type of customer we are always striving to secure and our experiences with you this past year have proven conclusively that this is the case.

"May we make a friendly suggestion? We hope you will not think it either impertinent or presumptuous.

"Our suggestion is this:

"Now that you have gotten in the habit of regularly saving this $10 a month, why not continue saving the amount and either put it in a savings account or put it to the even better purpose of securing more modern gas appliances for your home? We have some new appliances now which will be of interest to you, we feel sure, and we will be mighty glad to see and talk to you about them at any time.

"Also, there is another point we would like to bring up in this letter and it is that we'd like to secure some of your friends and relatives as payment plan customers. We feel that our experiences with you are the best sort of a recommendation for any of your friends or relatives you might bring to our establishment, as a man generally has for friends and relatives the same sort of folks that he is himself.

"Again congratulating you on completing the payment for your stove and hoping that, whether you act on any of the suggestions in this letter or not, you will come in and let us talk to you and hear how the stove is doing, we are,

"Yours truly,
"Central Gas Company."

Excellent Impressions Made

This sort of a letter would be certain to make a very excellent impression indeed upon its recipients and would lead to an increase in the friendly relations between the gas company and the customer with the result that the company would find it easier to get additional business from the customer and from his friends and relatives than might otherwise be the case.

Or, if the company did not send this sort of a letter to the customers who completed their final payments on purchases, the company could call up such people and say something like this to them:

"This is the Central Gas Company appliance department manager. I notice that you have just made your final payment on the stove you bought from us about a year ago and I thought I'd call up to find out how you like the stove by this time and to congratulate you on making the final payment. I've bought a lot of things myself on the payment plan and I know how happy I always feel when I get the last payment behind me.

"I suppose now that you have the stove paid for and are in the habit of making these $10 payments every month you'll be buying more things for your home. I'd like to have you come to our office and look at some of the dandy new gas appliances we've got for sale. I'm sure you'll find some appliances in our office that will be mighty interesting to you.

"When you do come in, please ask for me. I want to talk to you about your stove—I always like to hear what our customers say about the ranges we sell as in this way I get ideas and suggestions that help me in making more sales of ranges."

This sort of thing would make quite an impression on the folks and would bring a considerable number of them into the gas company office, with the result that it would be possible for the company to make sales to a considerable number of them of additional gas appliances.

Sending Out Cards

Again it would be an excellent thing for the gas company to have some handsomely engraved cards reading about like this:

"CENTRAL GAS COMPANY
"411 North Main Street, Centreville
"This is to certify that Mr..... has this day completed his final payment for a gas

range purchased from this establishment and has made all payments faithfully and on time.

"Signed .....
"Date ....."

This card, signed by the manager of the concern or the manager of the appliance department, could be prepared for each customer who completed an installment contract. Then the gas company could call up each family that made the final payment on a contract and say something like this to the family:

"This is the Central Gas Company. We've got a diploma here for you certifying that you made your final payment on your range contract with us and also stating that all payments were made promptly and on time. If you'll call at our office we'll be glad to give you this certificate. It is a bill of sale, in a way, and is also a record of an achievement of which you can be proud."

Bringing the Customers Into the Office

This would bring practically all of the installment contract completers into the office, and when they did come to the office it would be a comparatively easy matter to interest them in purchasing additional appliances and getting them started on additional contracts.

Also the fact of the gas company presenting installment finishers with these certificates would be a mighty good advertising proposition for the company. The company could reproduce the certificates in its regular newspaper advertising and could tell about how proud many of the company's customers are at having such certificates. This would give a different, novel touch to the company's advertising and would, unquestionably, help to make the advertising much more effective than might otherwise be the case.

The point of all this, then, is to make a big event of the completion of a contract by a payment plan purchaser. Do not let such events slip by unnoticed but cash in on them, because they offer splendid opportunities for getting more business from people who have gotten in the habit of buying goods on the installment plan from the gas company.

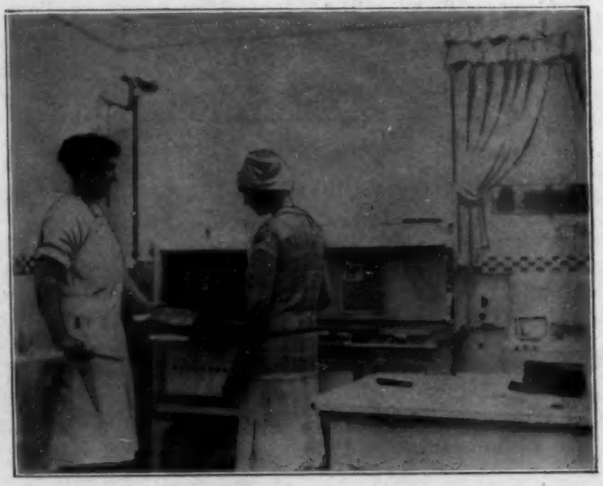
Interesting Display of Gas Ranges

C. W. Geiger

DURING a canning demonstration in the Sterling Furniture Store in San Francisco the Gas Appliance Society donated a forty-pound box of peaches to every purchaser of a gas range equipped with a thermostat.

An interesting display was made in the Market street window of the store during the week in which there was a box of peaches with a card reading "Before," while in the center of the window was a gas stove with several glass cans of peaches in the baker with a card reading "During," while to the right of the stove on the floor were arranged several glass cans of canned peaches with a card reading "After."

Miss Ann Williamson (Left) Giving a Demonstration of Cooking with Gas to Miss Ruth Sabichi



Demonstration of Cooking by Gas with Pressure Cooker

As The Journal Views It

UTILITY REGULATION

The question of utility regulation has always been one which has aroused more or less argument and discussion. Those who have been regulated do not always agree with those who do the regulating. There is unquestionably a good deal of truth in the contentions of both sides, and while in the early days of the regulation of Public Service corporations there was a great deal of controversy, we are happy to say that it does not exist at the present time.

Utilities do not object to regulation. They realize that the peculiar nature of their business makes it more or less of a necessity. However, they have objected in the past to the manner in which the regulation was conducted. It is possible, by exercising too much regulation and too much interference, to cause considerable trouble to the utility and to retard its growth as well as impair its usefulness.

In the long run it is the public that pays, for when the utility is not operating efficiently and the public is not receiving good service, it is their misfortune. They are the ones that are inconvenienced; their progress is impeded. It has been found in European countries where regulation has gone to the point of governmental control and ownership as well, that the utilities have not been able to develop nearly as much as those in this country. These have been the words of unbiased observers who have come from Europe to study the workings of our utilities. They should form a most effective argument against not only the government operation of ownership of utilities, but also against the undue exercise of regulatory powers vested in certain agencies of the law.

It is interesting in this connection to read the nine maxims which have been evolved by Carl D. Jackson as pertaning to nine economic laws upon which regulation of utilities is founded.

1. Adequate service is dependent upon adequate compensation for the service rendered.

2. A utility has no right to exact unreasonable rates for the service rendered.

3. Future reasonable rates cannot be determined or fixed by franchise contracts.

4. Every unreasonable burden upon utility service is a burden upon the consuming public.

5. The charges for service must provide for proper maintenance of the plant in good operating condition.

6. Unnecessary duplication of facilities is to be avoided, and competitive service can only be secured at unnecessarily high rates and costs.

7. Utility property devoted to a public use is still private property, surrounded by the guarantees in the Federal and State constitutions.

8. Regulation is not management, but management is a function of ownership.

9. All interested parties are entitled to a court review of any regulatory order.

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THE COMPLAINING GAS MAN

Constructive criticism is always desirable. It is profitable at all times. Those who are engaged in an enterprise are often blind to certain faults and certain imperfections in their methods. It may be very evident to others who have a more perspective view of the situation. The same consideration applies to the individual. All of us are more or less prone to self-analysis and whatever the faults or the good of this process, it is, nevertheless, certain that too much of it is harmful.

Thus, the gas man as well as any other individual, is apt at times to analyze himself and his industry and to arrive at conclusions which make him feel that it is all a lost cause and that there is nothing that remains except to give up the ship. He finds in this way much to complain about, much to find fault with, and being very closely associated with the workings of his industry, he often does not come to the correct conclusions and he is very apt to see things in a very much worse light than they actually exist. His analysis both of his own personal achievements and capabilities as well as those of his industry lead him to conclusions which are not only really destructive but also eminently unfair.

We do not wish to indicate that anyone or any industry is above criticism but when such criticism is made it should have for its purpose not to destroy, but to construct. There are many faults to be

found with the gas industry and with gas men, for all of us have faults. There are many things which could be said about our business and about ourselves that would not be classed as commendatory. In a good many cases this might be true and well deserved, but we should not, nevertheless, persuade ourselves that we are any the worse than the majority of others and that our problems are peculiarly unsurmountable while others are easily solved. This is not a time for despair and for crying out against fate and the Powers-That-Be, that perhaps do not see things in the same way as we do. This is the time for work and for steady progress, and rapid development will be secured.

Let us not allow ourselves to indulge in too much self-analysis of our own personal make-up and of our industry. There are many things which may today seem most difficult, but for which tomorrow might have a solution. Our duty is to carry on, and do our work the best way possible. We should all pull together. If we are all thoroughly imbued with a spirit of co-operation, helpfulness and the will to accomplish, the future of our business and ourselves is assured. There is nothing then that can impede our own progress or the progress of our industry.

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GAS HEATING SUPPLANTS LOW PRESSURE STEAM

(Continued from page 498)

Thus you will understand why a gas heating system displaced a low pressure steam heating system and you will realize why many owners will be glad to use gas if they are told of its merits.

The furnace takes up but a small amount of room, as the photograph shows, and for a small article asking but a small outlay, it does big things. Yea, verily! If it is heat you are looking for—use gas. More than 400 Denver homes are heated by gas and the "innovation" is hardly three years old.

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TAXATION OF UTILITIES

(Continued from page 502)

the Public Service Commission. Utility companies have nothing to conceal with respect to their business and often are called upon to demonstrate the question of how much money is invested in the enterprise and how much is earned thereon.

Unreported Property

The private corporations and individual citizens are not required to thus make public their affairs and, while it would hardly be just to state that they purposely conceal or deliberately withhold a proper statement to the local assessor, it is a matter of common knowledge that these corporations and that individuals rarely, if ever, report anything more than a small percentage of their total assets and possessions. In fact, it has been a simple matter for the State Tax Commission to compute from the annual statement of banks and trust companies, the amount of money deposited with them by corporations and individuals and to compare this amount of cash reported by all corporations and individuals and conclusively demonstrate that a great amount of so-called "intangible property" is never reported for taxation.

There never has been, and probably never will be devised a perfect system of taxation wherein the taxes will be levied with the constitutional requirement of uniformity and nondiscrimination, but under our present systems and with this vast amount of unreported taxable property, the burden of taxation is carried unequally, and by the very nature of things, too great a portion is being carried by the utilities.

Rural Influence

Another factor which must not be overlooked is the control of legislative and administrative affairs by rural population. There is no avoiding the fact that the majority of our legislators are from the rural districts, that legislation is dominated by the rural element and it is inevitable that administration is also so inclined. This influence is certainly demonstrated in the matter of taxation when from the reports of the State Tax Commission we find that within the last several years the assessed valuation of farms has been decreased by some $100,000,000, and more than this amount has been added to town lots, personal property and utilities. Many logical arguments are advanced to substantiate this shifting of the tax burden, including the inability of the farmers to absorb taxes on the present valuations, and the greater ease of absorption of taxes by city dwellers because of their ability to shift them on to other persons, but it has not been conclusively demonstrated that this shifting of the tax burden is entirely economical.

In the final reckoning the people pay all the taxes, including those levied on utilities and corporations, although the payment may pass through many hands before it reaches the ultimate consumer.

In the case of utilities it must be admitted that the majority of the users of their services are in the cities, but the extension of these services into the rural districts is growing rapidly and it is indicated in the not too far distant future that the rural dweller will have practically the same services at his command as are now accorded to the city dweller. However true this may be, it is still manifestly unfair for the users of utility services to pay the taxes for the non-users.

(Continued on page 510)

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

ALLOWANCE SALES ARE ALWAYS GOOD

GIVING the customer an allowance of from $5.00 to $10.00 on an old appliance, range or water heater, always proves an attraction. In playing up the "Allowance Sales," the newest idea is to dwell on the theme of "more freedom from pot watching" and the use of the modern oven heat regulator for better baking. Observers of newspaper advertising will note that the furniture dealer and the department store rarely dwell on the fact that all modern ranges have oven heat regulators, while on the other hand they do feature special prices.

Department stores however do not worry the gas man who is on his toes and who puts the proper punch behind his sales efforts.

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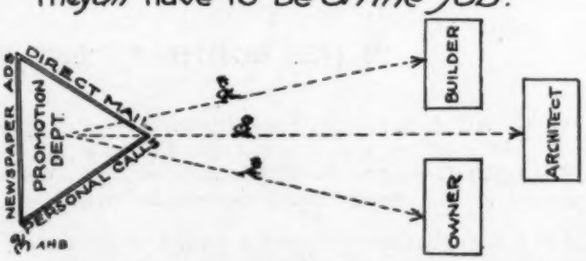
NEW PROSPECTS FROM OLD

A WESTERN gas company employed a novel plan to secure prospects for its salesmen. Whenever a new range was sold, the sales-manager of the company sent personal letters to the customer with a prospect form blank. This report stated that if any of the prospects, whose names the customer sends in, makes a purchase, the person sending in the names is given an aluminum cake pan for her trouble. The plan is not a new one but as it is working well with this company we pass it on for use by others.

APARTMENT HOUSE BUSINESS

GAS men who have been successful in securing the apartment house business over the country say: "To get this business the gas company sales manager must direct his sales effort to the owner, builder and architect." Each and every one of these must be appealed to by the printed word, newspaper advertising, direct mail advertising, and by personal solicitation. Some of the water heater manufacturers and gas range manufacturers and the American Gas Association are prepared to give those, who contemplate going after this kind of business, some material assistance in the way of furnishing data and plans. Those, who are interested, should start immediately to compile this data by writing to the Association and the manufacturers. In making up your portfolio of data do not fail to include photos of actual installations. This applies to homes and hotel kitchens as well as to apartment house kitchens.



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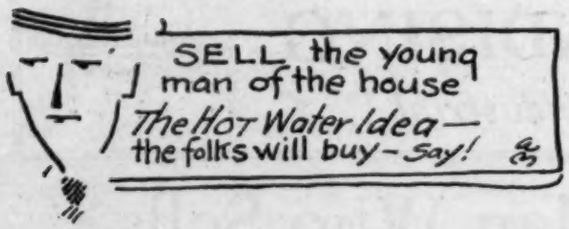
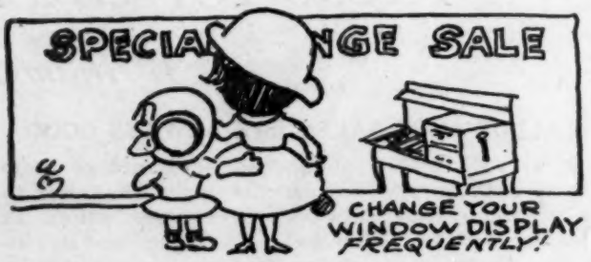
IS THE FLOOR SALESMAN IMPORTANT?

"IT seems to me," said a sales manager the other day, "that some of the gas companies are rather weak when it comes to floor sales. In a number of gas company stores, that I have visited recently, there seems to be a lack of push behind the men on the floor. Then, too, I found in several cases that the prospective customer was served by a young lady. Now the question that arises in my mind is: Are gas companies overlooking something here? Should there be a man or a young woman on the floor (I am speaking of the smaller companies), or both a man and young woman, and should they be real salespeople or just well versed regarding company policy, appliances, prices, etc?"



We should not like to attempt to answer these questions in the small space the editor permits us to use in one issue of The American Gas Journal, but we do wish to say that in our opinion the person or persons who are assigned to the floor sales work in any size gas company store should be first class in every respect, good salesmen from start to finish, salesmen who are paid a salary or a salary and commission that will enable them to live well, dress well and shoot square with all comers. We also have found that in numerous instances the floor salespeople in gas company stores "lack the push." And in cases where we made inquiry regarding compensation there was nothing left to wonder at. The floor salesman is important, more important in the sale of high-priced home appliances than in any other line we can think of at this moment, but he cannot be very "important" if the boss offers him no incentive—does not "cross his palm with silver."



House Heating and Golf

A gas company ties them up in advertising

TYING up househeating with the now so popular sport of golf is what the Portland Gas & Coke Company of Portland, Oregon, accomplished in the advertisement shown herewith.

The advertisement shows a rather irate-looking gentleman, more or less disheveled, swinging his axe at a hunk of wood and alongside of him a dingy old furnace.

Below this picture is shown the same gentleman, now dressed in up-to-date golf-togs, teeing off on the golf links. Alongside of him is a spotless basement with a gas furnace. Instead of cobwebs, a vase of flowers; instead of a wood-pile, a table and arm-chair. In lieu of ashes, a rug.

While the advertisement is striking enough to attract all readers, it will especially arrest the attention of everyone who plays golf and register on his mind. He will recall whenever he is playing golf or stoking a furnace that with a gas furnace he could use the hours for healthful exercise and pleasure which otherwise he has to put in chopping wood, stoking a fire, carrying out ashes.

While it is a long cry from a gas furnace to a golf links, nevertheless it is not as far as from the Netherlands (where the game of golf [kolf] was born and whence the Scotch adopted it) to the Pacific Coast of these United States, where the links are greener and the grass smoother than any place in America on account of the plentiful showers they are blessed with out there.

"The Gasco Link"

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 122

Combustion

Anthracite Coal

The final type of coal that remains to be considered is anthracite. This coal is the oldest form of solid fuel. It was formed so long ago that all the volatile ingredients have had a chance to escape or be decomposed and changed into the form of fixed carbon. The character of the coal changed as well, during this performance, with the result that it became hard in contra-distinction to the soft nature of the earlier types of coal.

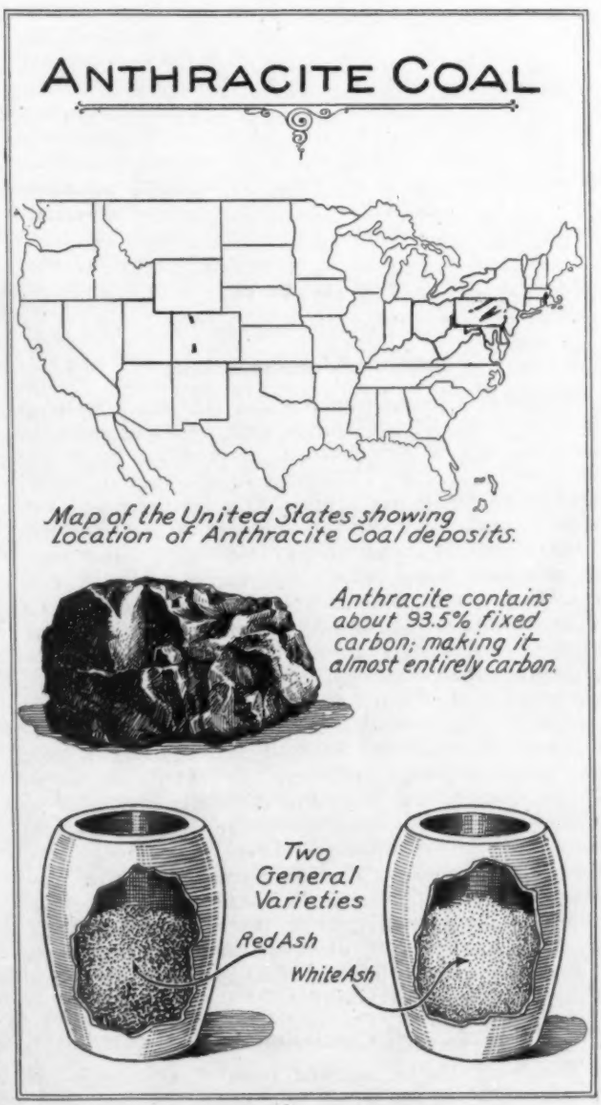
Thus, anthracite coal is also known as hard coal, as well as stone coal. Anthracite coal is considerably more difficult to ignite than the soft coals. It burns with a short blue flame and it does not soften or cake like the soft coals. It either crumbles away in the form of fluffy white or red ash or else forms more or less hard conglomerates of ash.

There is no question but that anthracite is the best of all domestic solid fuels. While its heating value is high, nevertheless it is not as high as that of some of the best grades of semi-bituminous and bituminous coal. It is only used for manufacturing purposes in sizes that are too small for domestic use.

Analysis of a typical anthracite coal is given in the following tabulation. The figures shown therein are on the ash and moisture-free basis. The moisture-content of the coal varies anywhere from 2.2 to 4 per cent., and the ash-content from 1.5 to 10 per cent.

	Per cent.
Volatile matter	6.18
Fixed carbon	93.82
Sulfur	0.62
Hydrogen	2.68
Carbon (total)	94.01
Nitrogen	0.99
Oxygen	1.74
Heating value	14,070 B.t.u. per lb.

A resume of the properties of the various solid fuels from lignite to anthracite coal is given in the following tabulation. It will be seen therefrom that the important chemical characteristics are the approximate percentage of moisture under normal conditions, and the ratio of fixed carbon to volatile matter.


ANTHRACITE COAL
Map of the United States showing location of Anthracite Coal deposits.
Anthracite contains about 93.5% fixed carbon; making it almost entirely carbon.
Two General Varieties
Red Ash
White Ash

Coal	Chemical Characteristics: Approximate per cent. normal mine moisture.	Chemical Characteristics: Ratio of fixed carbon to volatile matter.....	Physical Characteristics
Lignite	30-45	.....	Distinctly brown; either markedly clay-like or woody in appearance. Falls into pieces on exposure to weather.
Sub-bituminous ..	18-30	.....	Black, no distinct woody texture; disintegrates and loses moisture on exposure to weather, but less rapidly than lignite.
Bituminous	3-15	3	But slightly affected by exposure to weather.
Semi-bituminous..	3-6	3-7	But slightly affected by exposure to weather.
Semi-anthracite ..	3-6	6-10	But slightly affected by exposure to weather.
Anthracite	2-3	10-60	But slightly affected by exposure to weather.

¤ ¤ ¤ ¤ ¤

(Continued from page 506)

Natural Advantages Lost

There is a great fundamental fact entirely overlooked by the administrative authorities of our local communities in their haste to impose the burden of taxation on utilities. The possession of active, enterprising and growing utilities is a tremendous asset to any community and the low cost of their services are frequently, and should be more frequently pointed out, as a reason for the location of new inhabitants and the attraction of new industries. This advantage is promptly set aside when the community proceeds to tax the utility even though the utility is capable and perhaps willing to absorb this burden. It is enabled to and will do so because it passes the tax on to the consumer in the cost of his service, but it is distinctly uneconomical from any point of view to increase the cost of service so as to destroy the economic advantages which so many communities have by virtue of their natural resources. Proximity to cheap fuel supply and abundant water is a distinct natural resource possessed by some communities and when the community deliberately destroys these natural advantages by undue taxation of the agency using them it is depriving itself of one of its greatest assets and doing itself a great injury.

Conclusion

The lesson to be learned from these arguments is summed up in the word "education."

We need to educate ourselves to a proper understanding of the economic principles of taxation, to educate our employes and our customers so that they will appreciate to what extent they are being imposed upon by the present system of taxation and to educate all the members of the commonwealth to a fuller knowledge of governmental economy and administration to the end that the tax burden may be carried uniformly and with greater ease by all.

¤ ¤ ¤ ¤

It isn't hard to guess
that there's

A Gas Water Heater

in this house.

A good brisk shower to the tune of a whistle and a splash means that all's well in the bath room,—including the water, steaming hot at the turn of a spigot.

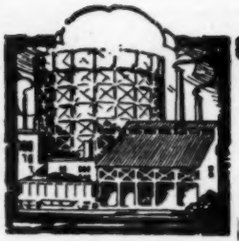
How about? Do you come out of your bath feeling like a million dollars—or do you come out with a grouch because of a luke warm trickle when you wanted a steaming flood of HOT water?

Install an instantaneous gas water heater in your home and end your hot water troubles. Come in and talk it over TODAY. The cost is low, the satisfaction high.

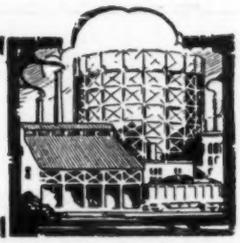
(Your Name and Address)

A.G.A.-590

When a Man Sings in His Bath, He Is Happy, Contented, Particularly as Gas Heat Is Giving Him Plenty of Hot Water



NEWS OF THE GAS INDUSTRY



Refrigeration with Gas Interests Gas Men

Commercial Gas Managers of New England Listen to Interesting Talk

The subject discussed at the May meeting of the New England Association of Commercial Gas Managers, held at the Hotel Westminster, Boston, at 6 P. M., Friday, May 28th, was artificial refrigeration by gas. Vice-president Howard B. Hall presided, and the speaker of the evening was Dr. Frederick G. Keyes of Massachusetts Institute of Technology, who for a score of years has been studying the scientific end of absorption refrigeration and has developed small units for the household.

Dr. Keyes in his opening remarks stated that refrigeration by means of the absorption system was nothing new. A machine was built as far back as 130 years ago. As a matter of fact the absorption system of refrigeration can really be said to have begun with the discovery of ammonia. In principle it consists of a substance that will be absorbed by another and then driven off when heat is applied. When the refrigerant is driven off by heat from the absorbent material it condenses and absorbs heat. As the absorbent material cools, it absorbs back the refrigerant.

A Necessity

"Artificial refrigeration," Dr. Keyes stated, "can no longer be classified as a convenience but as an actual necessity. It is, however, the small electric motor-compressor household refrigerator that has hitherto held the attention of those interested in this field. Indeed, only recently have the possibilities of the gas-operated household unit received attention and an appreciation developed of the tremendous opportunities for extending the use of gas by the introduction of gas refrigeration.

"To indicate how rapidly the introduction of the gas-operated unit may proceed, reference may be made to the rate at which the electric-motor-compressor unit has been introduced. The production of this household type of unit was about 15,000 in 1923, 26,000 in 1924, and 60,000 in 1925, and it may be conservatively estimated that in 1926 the total number produced will not be far from a quarter to a half million. Recollecting that there are nearly twenty million iced refrigerators in the country and less than 300,000 mechanical units in actual service, the magnitude of the business ahead in the household field alone may be easily envisaged.

"While the field of the household unit is at the present time an acknowledgeably important part of the refrigeration field, it is well to consider the further applications awaiting artificial refrigeration which will appear in the near future. These latter applications may be referred to as the commercial field.

For Ice Cream and Soft Drink Cooling

"The most important of the commercial applications, it is believed, is the soft drink-ice cream dispensing store. The electric-motor-compressor unit has now for a couple of years been cultivating this lucrative business, and it is the sort of application of artificial refrigeration which is most attractive from the point of view of the gas-operated unit. To this may be added the candy store, the grocery store, meat market, lunch room, restaurant, hotel, florist shop and ice-making plants. All these require cheap refrigeration and in most sections of the country this refrigeration can be produced most cheaply by gas with a machine having no moving parts to wear, no intricate electric mechanism of any kind, and hence long life.

"To form a partial picture of the magnitude of the field of artificial refrigeration, consider the ice production of Greater New York for a couple of years back, where the figures show nearly three and a half million tons of ice used. At a conservative estimate this quantity of ice would require about eight billion cubic feet of gas for its production. Extending this to the whole country would require multiplication by ten, or a total of eighty billion cubic feet for the entire country. Evidently, the quantity, eighty billion cubic feet of gas, represents consumption of gas for producing refrigeration, which it is safe to predict will scarcely be attained. It is well to point out, however, that in the production of refrigeration heat must be available at some part of the cycle of operation which terminates in the actual refrigeration. In the case of the electric-motor-compressor unit the coal pile is consumed to provide steam to drive the prime movers which in turn operate the dynamos furnishing the electrical energy needed to drive the motors connected to the motor-compressor units.

"By the use of gas, on the other hand, or perhaps liquid fuel, one applies practically directly the energy required to produce the refrigerating effect. The apparent anomaly involved in applying heat to one part of a machine and producing refrigeration at another, as in the case of the gas unit, is as great, therefore, for the electric-motor-compressor machine as for the gas machine. The production of cheap refrigeration is clearly, then, a matter primarily of cheap fuel, and it is not the result of a fantastic play of the imagination to believe that with cheap gas the traditional method of producing large scale refrigeration effect may be profoundly modified. It is well to recollect that the introduction of refrigeration by gas is going to proceed more or less parallel with the introduction of house heating by gas. The rapid growth of both

these projects depends, as matters of progress always have, on the quality of the imagination and the capacity for intelligent team work on the part of those interested in the development of the gas industry.

Small Scale Refrigeration

"It is of interest to consider the application of gas to small scale refrigeration in the field which is now most discussed, that of the household refrigerator. Those interested in the gas industry are interested to know the amount of gas that is likely to be consumed by the household unit, the type of machine, its distinguishing differences as contrasted with the electric-motor-compressor unit, its advantages as well as its disabilities.

"If the amount of gas which the average householder consumes is understood to be in the order to 36,000 cubic feet per year, the same household would probably use an average mechanical refrigeration equivalent to the melting of forty pounds of ice per day. A conservative figure for the amount of gas to produce this refrigeration would be 1.5 cubic foot of 500 B.t.u. gas per pound of ice, a total of 60 cubic feet per day or 22,000 per year. Using the figure 36,000 as representing the present consumption the gas supplied for refrigeration represents a sixty per cent. increase. If the average present consumption of gas per household is only 25,000 to 30,000 cubic feet per year, the proportionate increase in gas for refrigeration purposes would be greater than sixty per cent. The advantage of the situation presented is that to market the additional gas no further investment is required on the part of the gas company. The probable effect, moreover, of the introduction of gas refrigeration will be to stimulate the application of gas in the house for other purposes, particularly house heating.

The Absorption Type

"The unit to be used to obtain refrigeration by gas is, of course, the absorption type. In principle such a unit requires a substance capable of absorbing or adsorbing a refrigerant fluid such, for example, as sulphur dioxide or ammonia, which can be driven off by the application of heat. The oldest known absorption unit employed two volatile fluids, water and ammonia, the latter of which boils under atmospheric pressure 240 degrees Fahrenheit below the boiling temperature of water.

"During the last few years one company (National Refrigerator Company) has completed the development of another type (Ice-O-Lator) employing an anhydrous solid absorbing material, using anhydrous ammonia as a refrigerant. Both types at present employ water cooling and are sealed systems involving no moving parts subject to wear. The solid absorbent type of unit among other advantages can employ copper tubing for all connections, thereby facilitating installation. The refrigerating apparatus may also be disposed without reference to the interior liquid levels and the generator serves the dual purpose of generator and absorber. In the larger sizes the advantages of a solid absorbent over a liquid absorbent are very marked, due to the simplicity attendant on the use of anhydrous refrigerant and the avoidance of rectifying apparatus.

"The manufacturing costs of the gas-operated machine, because of the simplicity of design, compare favorably with the electric-motor-compressor unit of similar capacity. In fact, the machine consists of parts which can be made practically entirely by the use of automatic machinery and the costs in quantity may prove substantially lower than the more intricate mechanism required in the compressor type. The matter of life is very important and the information at hand indicates clearly that the useful life of a machine may be indefinite. The realization of very long life will depend largely upon skilful choice of material combined with well organized assembly control. Certainly the cost of upkeep promises to be very materially less for the absorption type as compared with the electric-motor-compressor units.

Distribution of Refrigerating Units

"The distribution of gas-operated refrigerating units is a subject which warrants the most intelligent consideration. It is believed that this can be accomplished with the best results through the gas companies, thereby avoiding the expense of complicated selling organizations, which have the effect of increasing the price of the refrigerating unit to the user. The electric companies have, in the past at any rate, viewed the development of the refrigerating unit as a current-using device which would always have to knock at their door. The less lethargic of electric public service companies are dissociating themselves from this point of view. The gas companies, it is hoped, will profit from the example of this indifferent tolerance and bestir themselves to assist in the development of the new young giant. As a matter of fact there is evidence enough already that many of the gas companies are alive with intelligent interest and eager for the chance to co-operate in every possible manner. It is the business of the manufacturers of the gas-operated refrigerating units to avail themselves of this interest and thereby save several years of what might have to be regarded later as misapplied effort."

The Discussion

In the discussion which followed this talk, it was brought out by the members that gas refrigeration could be sold to the householders with the greatest success only if a complete unit, including the refrigerator, could be offered, and that this unit would have to be of pleasing appearance. Dr. Keyes, in answer to this discussion, said that just such a unit as is desired is being perfected and should shortly be ready for marketing. It was his opinion that the first business to go after is the commercial business because in drug stores, candy shops, florists, ice-cream parlors and the like, the gas company has a strong selling argument in the economy of gas refrigeration. The cost is so low there is no competition and a lot of this business is waiting for the gas man to take it. After that he thought would be the best time to go after the household business.

Michigan Gas Men to Meet in June

Fine Program Planned

Grand Rapids, Mich.—The Michigan Gas Association will meet June 24th to 26th, 1926, at Mackinac Island, Mich. The annual meeting of the Michigan Electric Light Association will be held at the same time.

The business program of the meeting is tentatively as follows:

Thursday, June 24th, 10 A. M.

Address of president—B. G. Campbell.

Report of Special Rate Committee, F. A. Newton, chairman.

"Development in Gas House Heating," David H. Frazer, Jr., Battle Creek, and others.

"Demand Gas Meters," E. E. Hardy, Jackson.

"Sales Promotion," R. J. Canniff, American Gas Association.

Saturday, June 26th, 9:30 A. M.

Report of Fellowship Committee, F. W. Seymour, chairman.

"Disposition of Ammonia By-Products," H. W. Jackman, Holder of Fellowship.

"Ammonium Sulphate as a Fertilizer," Professor McCool, Michigan State College, Lansing.

"Developments in Water Gas Manufacture," Frank W. Steere, Steere Engineering Company.

Address, "Public Relations," J. B. Wootan, Public Service Magazine, Chicago.

A joint session will be held on the morning of June 25th, under the auspices of the Michigan Committee on Public Utility Information at which there will be speakers of national prominence.

The entertainment committee, under chairmanship of John K. Swanson, is preparing an attractive program, and in co-operation with the ladies' committee, of which Mrs. F. D. Avis is chairman, is giving particular consideration to the entertainment of the ladies. Members this year especially should not fail to bring their wives, as this is going to be an event which the ladies will talk of for years to come. The banquet and prize drawing this year will be held on Friday evening. James Schermerhorn, celebrated raconteur, will be the speaker of the evening.

Pennsylvania Gas Men to Hold Meeting

First Gathering of Kind Since War

On Thursday, June 24th, history will be made! The names of two famous organizations will be linked when the Pennsylvania Gas Association journeys to the Pomeroy County Club (just outside of Reading, Pa.) to hold their first annual outing since the war.

This gala occasion was unanimously sponsored by the association at the Scranton meeting in December, 1925, and the committee then appointed has completed arrangements for a day of real sport, entertainment and feasting.

The Pomeroy County Club is situated near Sinking Springs, six miles west of Reading and three blocks from the Harrisburg-Reading pike. It is easily accessible by automobile and there are ample parking facilities.

For the benefit of members arriving by train, the Consumers' Gas Company, Reading, Pa., has kindly consented to furnish transportation to the club. Cars will leave the gas company's offices, 441 Penn street, at 10:30 A. M. and 12:45 P. M., Eastern Standard Time.

Join the party and enjoy a good day's fun! We are insured against dull moments by the many attractions offered at the Pomeroy Country Club, some of which are as follows:

Tennis courts—Bring your racquet and start one.

Baseball diamond—Gas Men vs. Peddlers.

Swimming pool—Where the plungers cool off.

Bowling alleys—Rock 'em and sock 'em.

Quoiting courts—For all ringers.

Volley ball—No service charge.

In addition to this incomparable line-up we will have with us "Reading's Famous Bathing Beauties" in a fancy diving and swimming exhibition.

And now for the eats! Lunch and refreshments will be served at noon, and at 4:30 P. M. we will stage the "Last Run" to the spacious dining veranda surrounding the club house, where Whitners, the well-known Reading caterers, will endeavor to fill your "Holders" with their famous chicken dinner of a high B.t.u. standard.

* * *

National Stove Company Division Changes Name

After June 21st, the National Stove Company Division of the American Stove Company will be known as the Direct Action Stove Company Division. It is indicated that the name "Direct Action" has been so identified with the product in advertising that it is deemed advisable to change the name of the company to agree with that of the product.

* * *

Industrial Men Asked to Co-operate

To further the gathering of valuable industrial gas data, the Progress Committee of the Industrial Gas Section of the American Gas Association has requested that all men in the industry co-operate by sending all information they have on hand to the committee. Blank sheets can be obtained from A. G. A. headquarters, 342 Madison Avenue, New York, N. Y. These sheets make the tabulation of this information an easy matter.

The purpose of the survey is to place at everyone's disposal sales information that has proved of value. In selling gas to an industrial prospect it is often advisable to point out what others in similar lines of business are doing.

* * *

Rockland Light & Power Company Chartered

Albany, N. Y.—Rockland Light & Power Company, Nyack, N. Y., formed by consolidation of Rockland Light & Power, Orange County Public Service Co., Inc., and Catskill Power Corporation, has been chartered at Albany with a capital of $26,000,000. Charles H. Tenney, 35 State Street, Springfield, Mass.; D. Edgar Manson, 200 Devonshire Street, Boston, Mass., and Alex. S. Burns, Jr., Spring Valley, N. Y., are directors and subscribers.

Like Father Like Daughter

Circus Tastes and Writing Ability Are Inherited

Bridgeton, N. J.—A prominent gas man appears again in print in the person of his daughter. Helen W. Jones, daughter of Mr. and Mrs. Jacob B. Jones, received honorable mention for the following letter on Circus Day:

"Why I Like to Go to the Circus"

"I guess the reason I like to go to the circus is because Daddy is crazy about it. He started going when he was four years old and as far as I know he hasn't missed one since! From the time he was able to sneak in under the tent until today when he takes the whole family, Daddy has never missed a circus.

"I have often heard him say that some circuses are better than others, but he has never seen a bad one yet.

"When I was a little girl, Daddy used to tell me about some of the old-time circus features. Every time we go out Hampton Street he points out the spot where Captain Paul Boynton did his water act. Then he tells us about the 'million gallons' of water he carried to the elephants.

"At about the time Daddy broke into the show P. T. Barnum was putting on the opening spectacle of the 'Fall of Ninivuh.' Daddy wore a tin suit and carried a spear as one of the Roman soldiers and after that he stuck on a front seat to see the rest of the show.

"He has quite a memory for circus acts and circus people and he used to tell us about the time that 'Pawnee Bill' (Major Gordon W. Lillie) was stranded in Bridgeton and how the old city band came to the rescue and played for the show. I guess Daddy was pretty little then, but he still remembers (as do some of the boys who played in the band) how they nearly 'busted up' the show when the monkey kicked a hole in the bass drum.

"I like to go to the circus with him, and my sisters do, too, just because it is a wonderful day for us all, as he seems to know a lot about circus people and a lot know him, for when Orrin Davenport gives a nod of recognition it is just because they have known each other for years.

"He tells us a lot of stories about 'Spader' Johnson and the rest of the clowns and about 'Birdie' Millmun and her wire act.

"Watching three rings and four stage platforms keeps him busy, but he sees the whole show. When I was a little girl he taught me the trick of doing this, for whenever a 'casting' act is working up to a pass and catch they never do it the same way twice over all the nets. So the idea is to watch the work-up and then turn your head quick to watch the catch.

"Daddy often says he wishes the circus would put back in their programs the old-time leaps. That is where the clowns and acrobats start on a running board near the top of the tent and then come down and somersault across the backs of the elephants. This is a feature they dropped a few years ago, but it always had the same pull and the same laugh.

"Mother tells us a story of how Daddy and Bob Crowell were making a swing around the United States a few years ago. They were on the sleeper going from El Paso, Texas, to New Orleans. The train stopping at about 5 o'clock A. M., woke Daddy up. Glancing from the car window he saw Barnum and Bailey circus unloading as Houston, Texas. Although they had their reservations through to New Orleans, he woke Bob up and said, 'We're going to get off here. There's a circus in town.' And they did! I reckon that's why I like the circus.

'This story as to 'Why I Like the Circus' may seem a bit intimate, but I must have inherited it. Daddy doesn't know I'm writing this.

"When the leaves begin to come out on the trees, we can tell that it is getting near circus time, for Daddy begins to get restless. Mother knows when he says that he has 'important business' in Philadelphia that Mr. Ringling or Mr. Barnum or Mr. Bailey is going to have company. This year the 'itch' became unbearable on Friday afternoon. As usual it was the 'best show ever.' But on May 18th we expect the same old attack and the second row of Section E will find him under the 'big top.'"

* * *

Charles B. Officer Appointed Chief Engineer

The Sullivan Machinery Company announces the appointment of Charles B. Officer, hitherto assistant to the president on engineering matters, to the position of chief engineer of the company, in charge of engineering matters with regard to new machinery or changes in existing designs.

Mr. Officer is a graduate of Yale University (Sheff., 1912, M.E., 1915) and has been connected with the company ever since his graduation.

* * *

OKMULGEE GAS FIRM IS SOLD

Oklahoma Natural Takes Over Property

Okmulgee, Okla.—The Okmulgee Daily Times said the Okmulgee Gas Company, supplying more than 9,000 consumers in this city, was purchased recently by the Oklahoma Natural Gas Company for the consideration of slightly less than $500,000.

The Oklahoma Natural Gas Company taps practically every paying natural gas field in Oklahoma and sells gas to practically every community gas company in the State.

Its auditors completed their check-up of the Okmulgee Gas Company, managed by Ray Hinchey, and the office forms, billheads and bank accounts have been changed to Oklahoma Natural Gas Company.

Within a few weeks, the Times said, the Oklahoma Natural Gas Company's principal stockholders in Pittsburgh, Pa., who recently acquired the Kingwood Pipe Line Company, here, tapping the Okmulgee, Creek and Okfuskee county gas fields, will take over the Kingwood Company, but will not change the pipe line firm's name.

The Okmulgee Gas Company, in business here for several years, was owned by Pittsburgh men, and the "sale" of the local gas company in reality is a merger of interests of the Pittsburgh men who control the Okmulgee Gas Company and the Kingwood Pipe Lines.